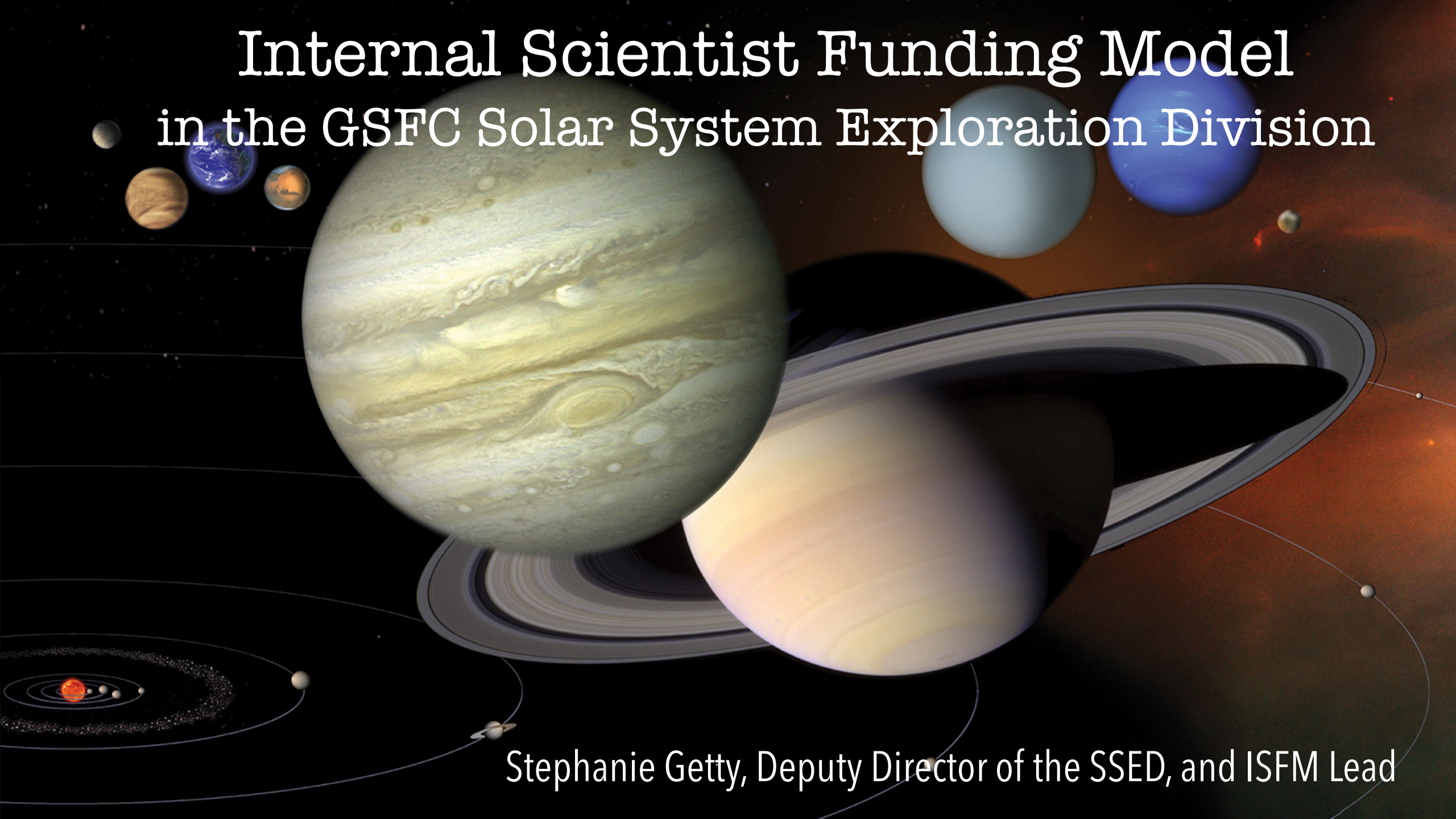
Internal Scientist Funding Model
in the GSFC Solar System Exploration Division

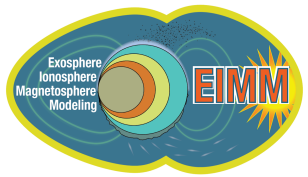


Stephanie Getty, Deputy Director of the SSED, and ISFM Lead

Overview: SSED's 5 Work Packages

https://ssed.gsfc.nasa.gov/MajorRandAThemes/index.html

Exosphere Ionosphere Magnetosphere Modeling

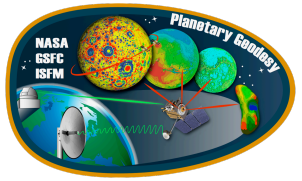


Leads:
Menelaos Sarantos
O.J. Tucker

Fundamental Laboratory Research

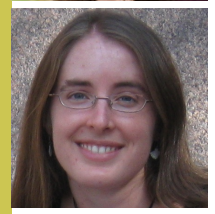
Leads:
Jamie Elsila
Jen Stern

Planetary Geodesy



Lead:
Erwan Mazarico

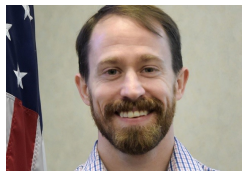
Goddard Instrument Field Team



Leads:
Kelsey Young
Amy McAdam

Sellers Exoplanet Environments Collaboration

Leads:
Avi Mandell
Ravi Kopparapu



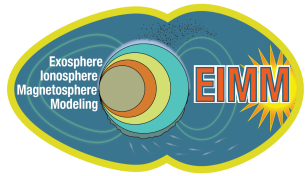
Ricardo Martinez,
Quinton Nabors
Business Mgmt Officer
Senior RA

Marley Fleishman
Admin Support

Shaigh Sisk
Admin Support

Overview: SSED's 5 Work Packages

https://ssed.gsfc.nasa.gov/MajorRandAThemes/index.html



EIMM, Exosphere-Ionosphere-Magnetosphere Modeling: Exploration of plasma, dust, and atmospheric escape at various planets and bodies in our Solar System.

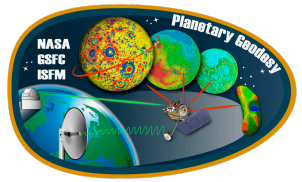
Leads:
Menelaos Sarantos
O.J. Tucker

34 scientists & students
53% planetary
44% heliophysics
3% astrophysics

FLaRe, Fundamental Laboratory Research: Exploration of planetary environments through lab experiments, observations, and simulations.

Leads:
Jamie Elsila
Jen Stern

75 scientists & students
100% planetary



Planetary Geodesy: Fundamental physical parameters of planetary bodies, including the internal structures of planetary bodies, atmospheric dynamics, and global and local geophysical analysis.

Lead:
Erwan Mazarico

15 scientists & students
73% planetary
7% heliophysics
20% Earth science

GIFT, Goddard Instrument Field Team: analysis of rocky analog environments through instrument field campaigns at analog sites on Earth.

Leads:
Kelsey Young
Amy McAdam

35 scientists & students
97% planetary
3% Earth science

SEEC, the Sellers Exoplanet Environments Collaboration: improving our ability to characterize exoplanets through interdisciplinary physical modeling, observing and data analysis, and future mission planning.

Leads:
Avi Mandell
Ravi Kopparapu

55 scientists & students
49% planetary
13% heliophysics
18% astrophysics
20% Earth science

Success Metrics

Pilot Phase:

Note that these are conservative numbers…

No. of active projects	No. of participants	Proposal Reviewers (panel/ext)	Papers and book chapters	Conference presentations	New External Collaborations
98+	**155+**	**81+/65+**	**148+**	**286+**	**100+**

Scientific Benefits:

- Productivity
  - Reclaimed proposal-writing time has led to more **time for science and paper-writing**
  - One-year pilots enable **idea growth for early-careers** without burdening R&A programs
  - Flexibility to **optimize field campaign** opportunities (GIFT)
  - **New modeling** approaches and intercomparisons enabled (SEEC, EIMM & Geodesy)
- Strengthening Cross-divisional Science
  - Our work packages engage scientists **across the four divisions** to work on common projects
- Keeping Science and Missions Integrated
  - Examples: **fundamental science to support mission products** from MAVEN, OSIRIS-REx, LRO, MSL, Dragonfly, Dawn, MESSENGER, LADEE, Cassini, space telescope design, ground observations
  - Providing fundamental **scientific motivation for future concepts** for Ocean Worlds, Moon, Large Space Telescope concepts
- Improved funding stability helping to **promote "equality"** for our soft-money science community

Broad Benefits of ISFM… to HQ and the Community

- Increasing **emphasis on service** in our Internal Scientist community
- **Reduced proposal burden** to ROSES
- Increasing **availability of review panelists**
- Increasing **communication and collaboration** between groups at the Field Centers
  E.g., Virtual Seminar Series, highlighting speakers from FLaRe, GIFT, and JSC
- Improved **flexibility in collaborations**, enabling rapid response to special events (e.g., meteorite falls)
- Increasing **availability of SSED facilities** to the community
  Examples: Cosmic Dust Lab provides unique samples to outside collaborators; Gamma ray Neutron Test Facility is used by outside collaborators
- Developing **modeling and analysis tools** for use by the external community
  PSG: Planetary Spectrum Generator
  EMAC: Exoplanet Modeling and Analysis Center
  Planetary-focused GEODYN; illumination modeling supporting Artemis & Commercial Lunar
- Increasing **access to shared resources and expertise** for field work
- Hosting **community meetings**: e.g., Annual SEEC Symposium

SSED Implementation Principles

Guiding Principles

- Minimize our time spent writing R&A proposals…
  WHILE maintaining accountability in the pursuit of scientific excellence

  → Mini-proposal process, with flash-talks, SSED review panel
- Encourage collaboration across the Solar System Exploration Division and Science Directorate…
  WHILE respecting Lab priorities through lab mgmt involvement

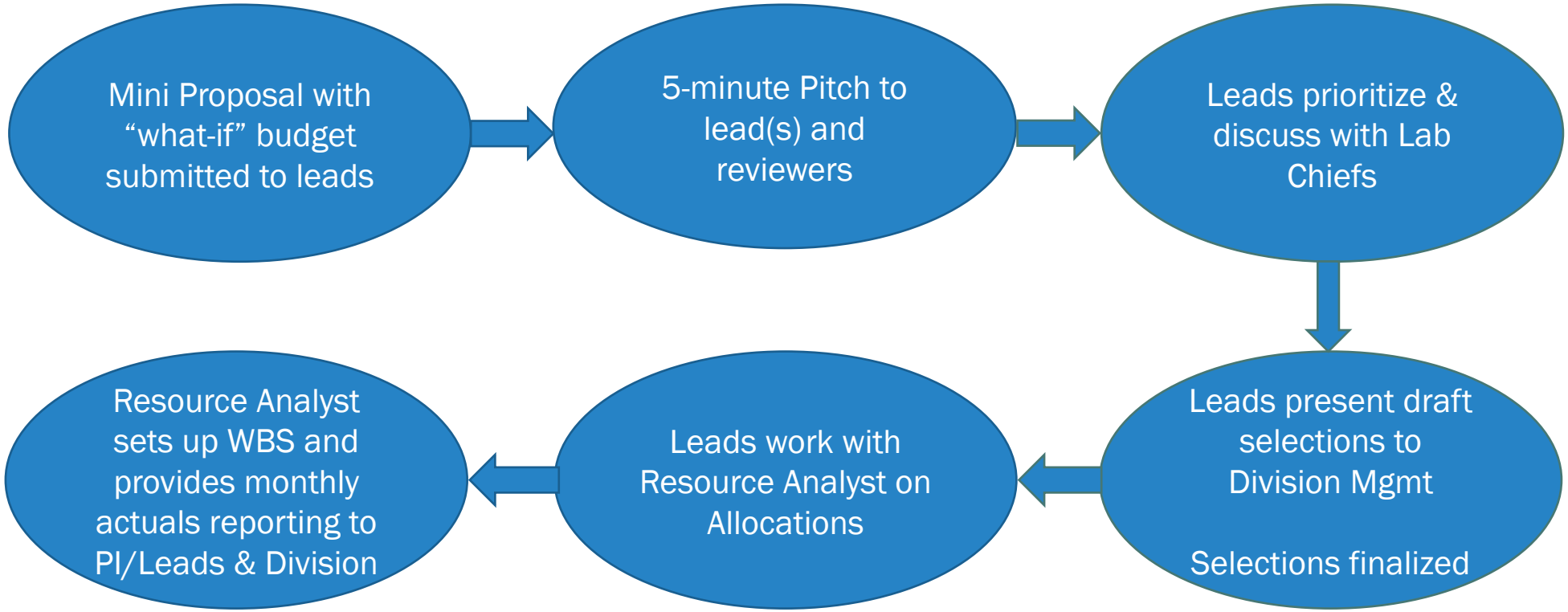
  → Appoint interdisciplinary, non-manager team leads, include managers in review
- Pursue stable labor support for CS workforce…
  AND soft money workforce in critical areas

  → Civil servant-led proposals include all team members needed to do their science
- Develop proposal writing skills for early-career CSs…
  WITH mentoring from mid-career and senior Internal Scientists

  → Early-career scientists propose to ROSES, also involved in ISFM-funded projects
- Connect to community landscape and explore new directions by maintaining ~ 20% competed work…
  AND through regular communications with HQ

  → Invite HQ points of contact to End-of-Year Review

ISFM Mini-Proposal Process



SSED Mini-Proposal Template

ISFM Mini-Proposal Template (replace with title)

Team: (include both civil servants and contractors)

Summary of Proposed Effort: (Describe the proposed project, including major objectives of the work)

Science Motivation and Linkage to Past Work: (Describe how the proposed effort continues previous Goddard efforts; describe how it addresses a key problem in planetary science; include references to current literature; describe how this work would have been funded in the absence of the ISFM work package)

Anticipated Service to the Community: (Provide a description of anticipated new tools, datasets, and/or analytical techniques that will result from this work; describe how these will provide benefits to the community; why is this a NASA function, and why should it be directed rather than competed)

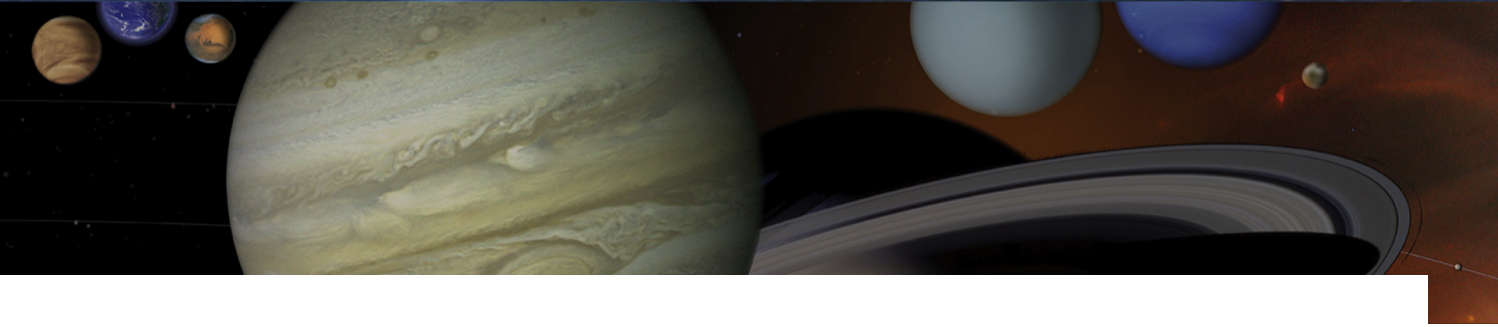
Science Products: (Provide a list of tasks and/or milestones that correlate with deliverables – papers, new collaborations, invited and contributed presentations – that can be used to demonstrate the productivity of the work under ISFM)

Budget Request: (Use the SPSO budget template (in "what if" mode) to provide a full-cost budget request for the duration of the proposed work; include CS labor, CN labor, procurements, travel, etc.; describe the role and level of effort for each team member; list related ROSES proposals and awards; list a desired start date to allow for fiscal year budget funding)

SSED Internal Review Process

- Proposals due 1-3 times per year, depending on work package
- Written mini-proposals are complemented by flash talks, followed by Q&A
- Panel = Division management + Lab management + WP Leads
  - Where there is cross-work package dependency, Leads from both WPs participate
  - For some WPs, the panel rotates with scientist participation to provide experience
- Open attendance for flash talks, but only panel asks questions
- Leads prioritize selections, inform Lab Management, and present priorities and rationale in a decisional meeting with Division Management
- Selection rate is typically high, benefitting from early and iterative discussions with WP Leads regarding proposal topic and scope alignment with WP science

Looking Ahead



Continue and Sustain:

- Traceability from winning ROSES awards
- Involvement of early-career scientists
- Dissemination of results through publications, conference abstracts and presentations
- Encouragement of interdisciplinary science, maximizing mission science
- Strong community and HQ connections:
  - Accessibility of data to community
  - Hosting cross-community, cross-disciplinary workshops
  - Serving on review panels
- Active planning in light of pandemic impacts
- Maintain strategic coordination across work packages through SSED management